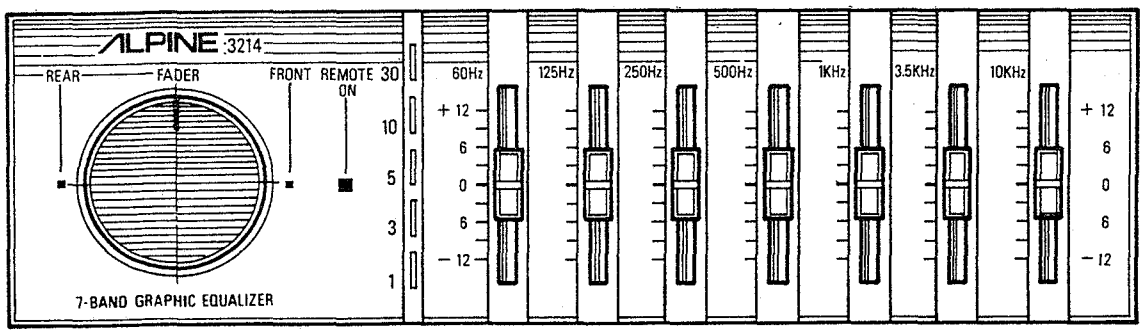
ALPINE SERVICE MANUAL

7-Band Graphic Equalizer Amplifier



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Specifications

Power Supply	14.4V DC (11.0V to 16.0V allowable)
Grounding System	Negative Type
Current Drain (Output 8W/ch)	5.0A
Power Output (1 kHz, 8%)	12W/ch
Equalization Range	±10dB
Equalization Frequency	60 Hz/125 Hz/250 Hz/500 Hz/1 kHz/3.5 kHz/10 kHz
Frequency Response (−3dB, Output 1W)	50 Hz to 15 kHz
Residual Noise (Input shorted)	3.0 mV
Input Sensitivity/Impedance	500 mV±1 dB/10k±2k ohms
Channel Separation	40 dB
Signal to Noise Ratio (IHF-A)	70 dB
Total Harmonic Distortion	0.8%
Output Impedance	4 ohms
Semiconductors	7 ICs, 2 Transistors, 6 Diodes
Dimensions (W×H×D)	150×42×150 mm

Parts Locations and Disassembly Instructions

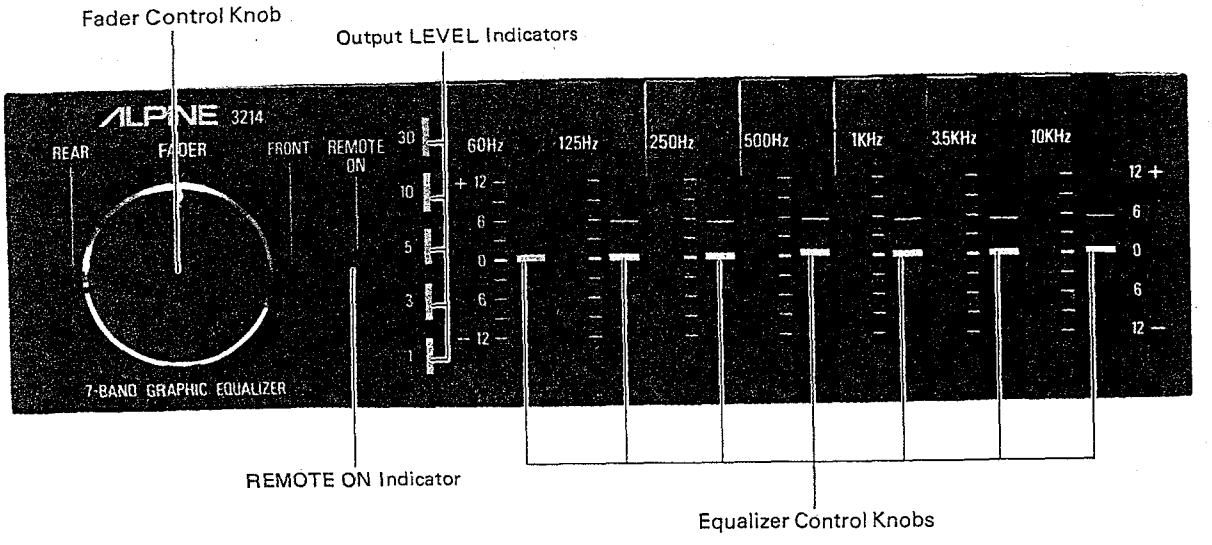

Figure 1

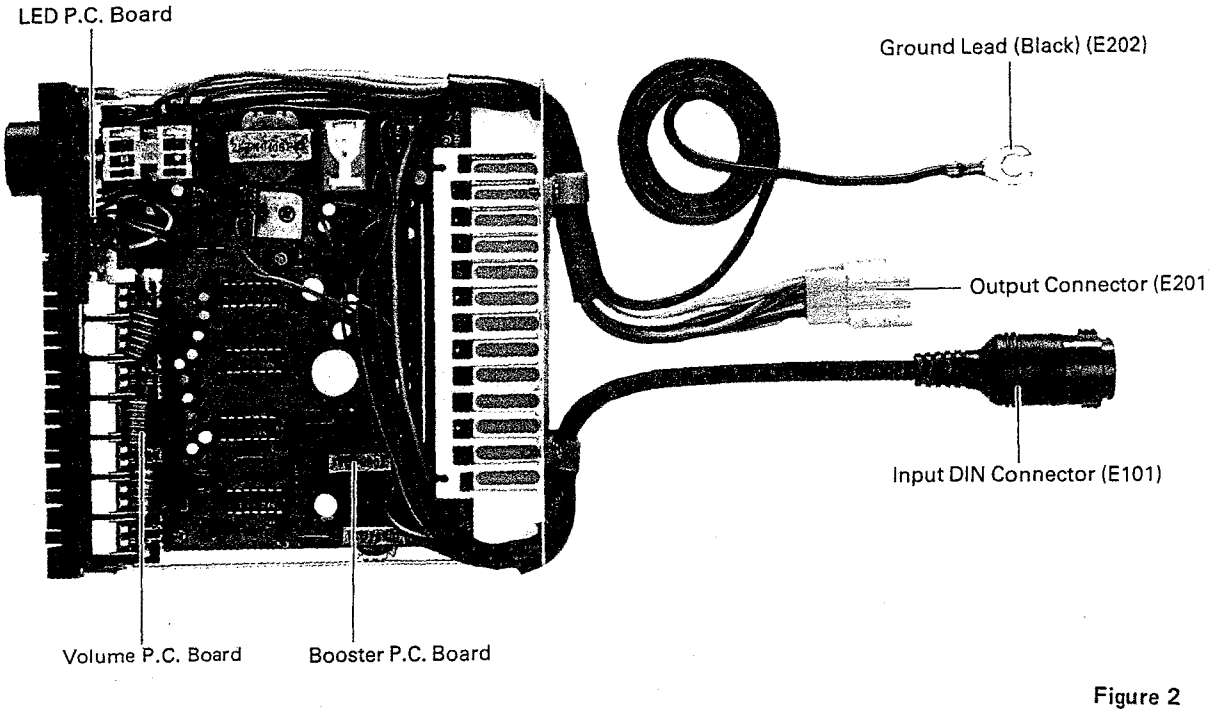

Figure 2

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1. Removal of Top Cover

(1) Remove four screws marked "○" in Figures 3 and 4.
(2) Pull out the top cover in the direction of the arrow as shown in Figure 3.

2. Removal of Nosepiece

(1) After removal of top cover, remove fader control knob and equalizer control knobs as shown in Figure 3.
(2) Remove two screws marked "△" in Figure 5.

3. Removal of Booster P.C. Board

(1) After removal of top cover and nose piece, remove nut and washer as shown in Figure 6.
(2) Remove twelve screws marked "★" in Figures 4, 6 and 7.
(3) Disconnect all wires from Booster P.C. board.

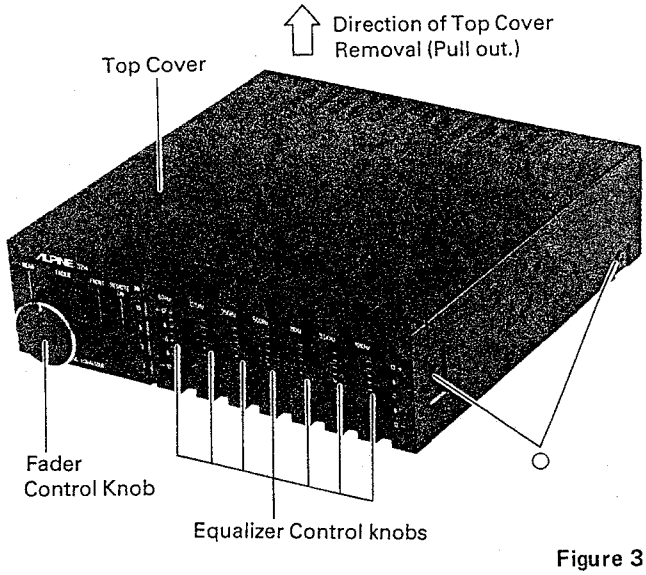


Figure 3

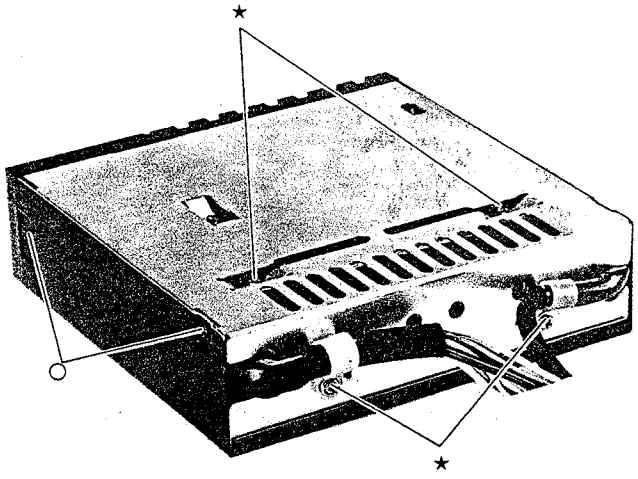


Figure 4

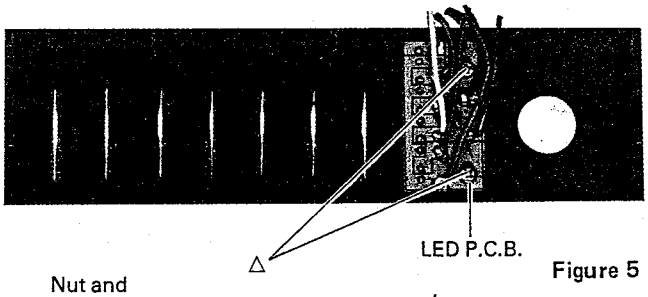


Figure 5

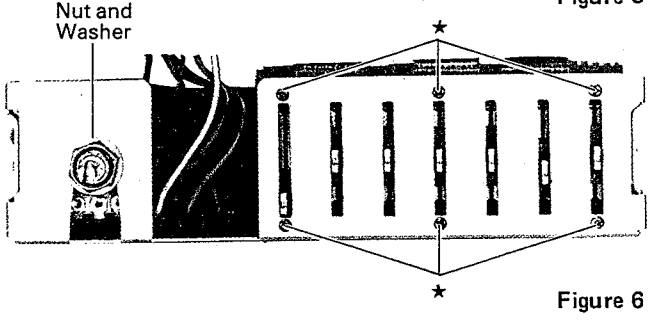


Figure 6

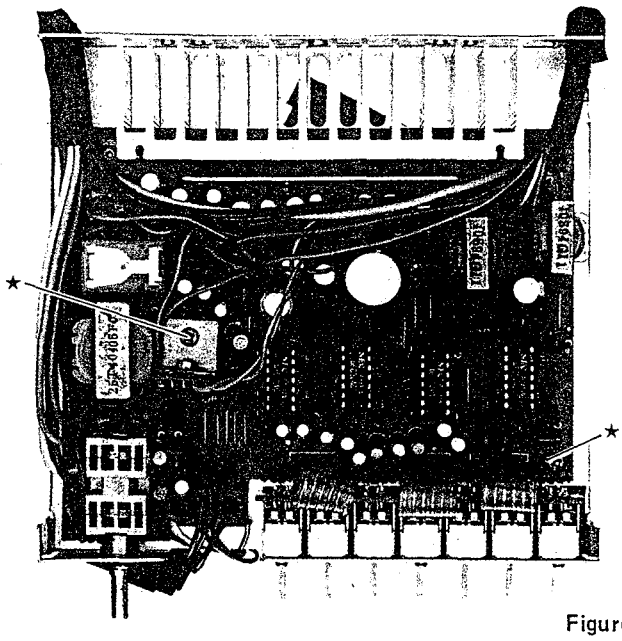
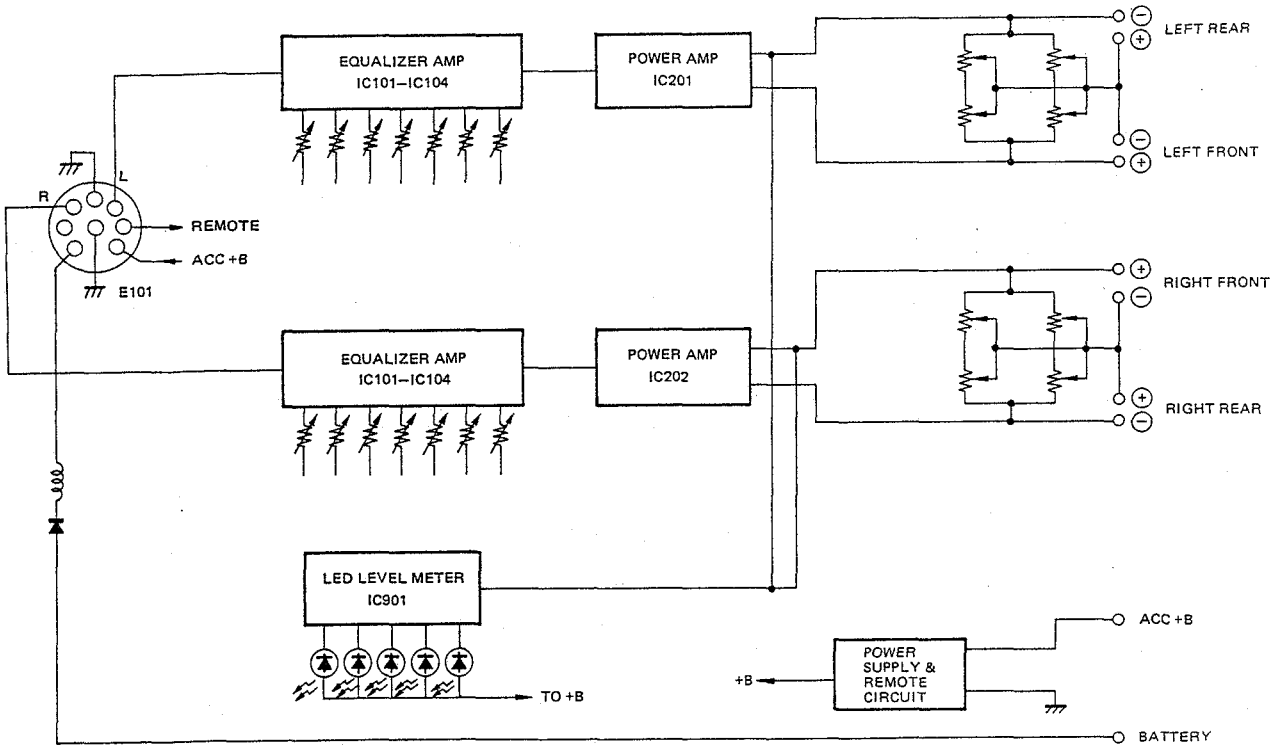


Figure 7

Block Diagram



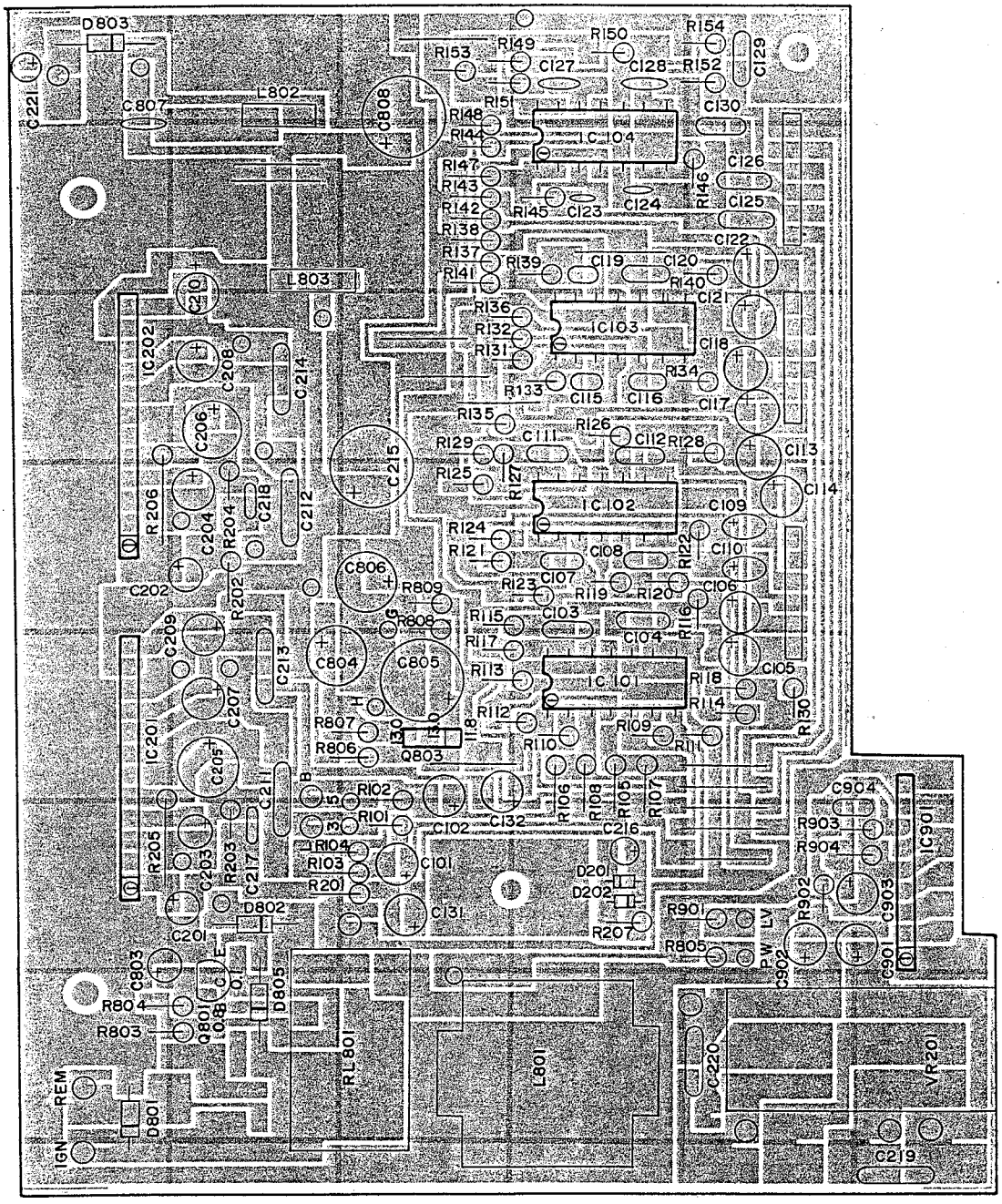
Parts Layout on P.C. Boards

● **Booster P.C. Board**

IC101–IC104

1	2	3	4	5	6	7
6.1V	6.0V	6.0V	11.8V	6.0V	6.0V	6.1V

8	9	10	11	12	13	14
5.6V	5.6V	5.4V	0V	5.4V	5.6V	5.6V



Top View

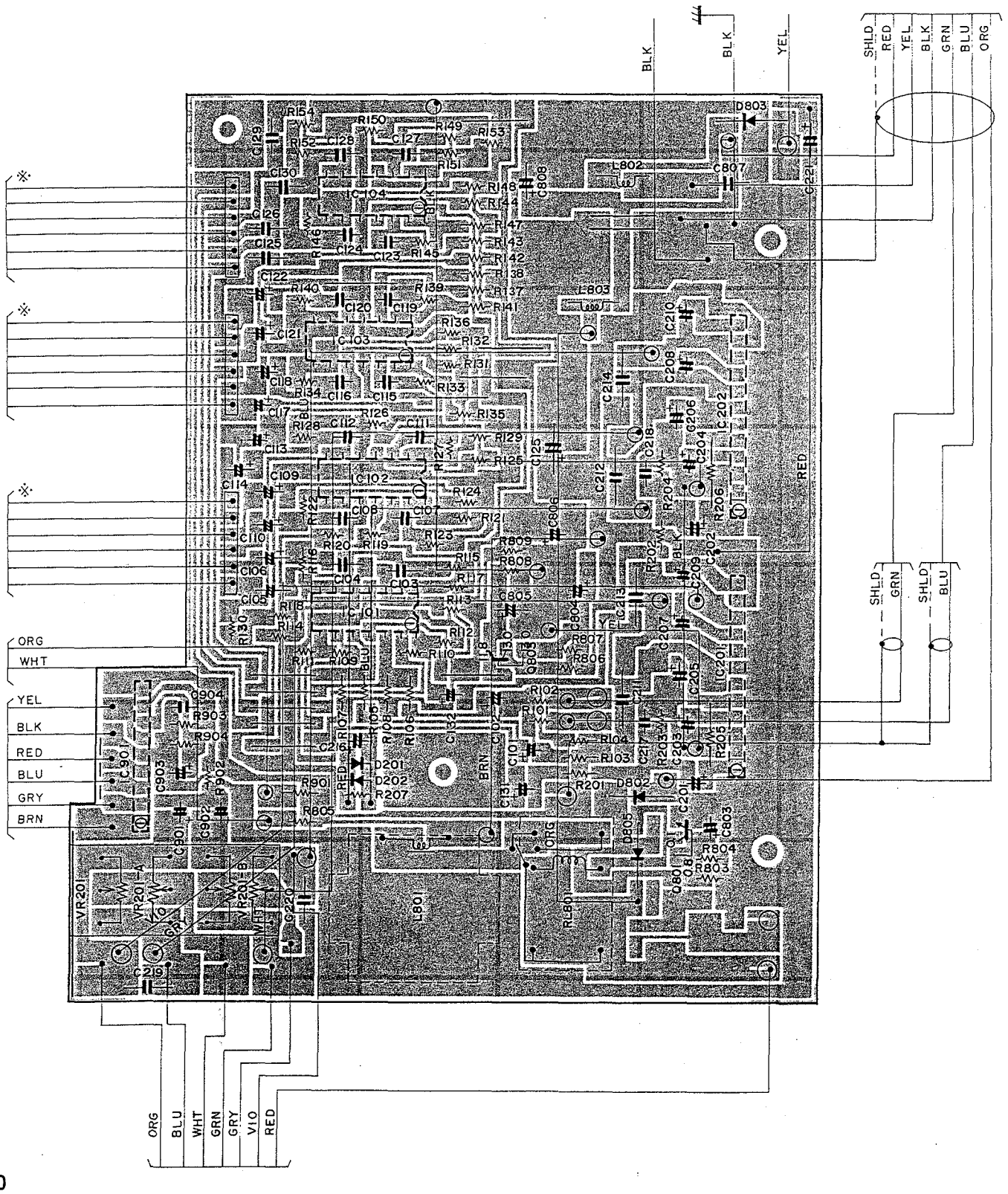
IC201, IC202

1	2	3	4	5	6
4.15V	0 V	0.75V	4.16V	4.16V	3.80V

7	8	9	10	11	12
0 V	7.60V	13.25V	7.6 V	14.32V	13.22V

IC901

1~4, 6	5	7	8	9
12.9V	0 V	0.28V	0.03V	14.32V


1
2
3
4
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6
7
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9
10
A
B
C
D
E
F
G
H
※
※
※
ORG
WHT
YEL
BLK
RED
BLU
GRY
BRN
BLK
BLK
YEL
SHLD
RED
YEL
BLK
GRN
BLU
ORG
SHLD
GRN
SHLD
BLU
RED
ORG
BLU
WHT
GRN
GRY
VIO
RED
D803
L802
C807
C808
L803
C210
C206
C214
C202
C218
C204
C206
C125
C212
R204
R206
C209
C213
C207
C205
C201
C211
C217
R203
R205
D802
C201
C803
R804
C804
C801
RL801
L801
C220
C219
VR201
R901
R902
C901
C902
C903
C904
R903
R904
D201
D202
R207
R801
R805
C216
C802
C801
C10
R201
R202
R203
R204
R205
R206
R807
R806
R809
R808
C805
C806
C803
C804
C213
C207
C205
C201
C211
C217
C203
C209
C202
C218
C204
C206
C214
C212
C125
C202
C210
L803
L802
C807
C808
D803
C221
C129
R154
R150
R149
R153
R152
C128
C127
R151
C130
IC104
R148
R144
R147
R143
C126
C125
C124
C123
R145
R142
R138
C122
R140
C120
C119
R137
R141
R136
C121
C103
R132
R131
C118
R134
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C115
R133
C117
R128
C112
R126
C111
R135
R129
C113
C109
IC102
R125
C114
R124
C108
C107
R123
R122
R120
R119
R115
C110
C106
C104
C103
R117
C105
R118
R113
C101
R112
R114
R130
R110
R111
R109
R108
R106
R107
R105
R102
R101
R104
R103
C10
C13
C2
C216
BRN
ORG
BLU
BLU
RED
RED
ORG
VR201
VR201 A
VR201 B
GRY
WHT
C219
C220
L801
RL801
C801
C802
C901
C902
C903
C904
R903
R904
D201
D202
R207
R801
R805
R807
R806
R809
R808
C805
C806
C803
C804
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C203
C209
C202
C218
C204
C206
C214
C212
C125
C202
C210
L803
L802
C807
C808
D803
C221
C129
R154
R150
R149
R153
R152
C128
C127
R151
C130
IC104
R148
R144
R147
R143
C126
C125
C124
C123
R145
R142
R138
C122
R140
C120
C119
R137
R141
R136
C121
C103
R132
R131
C118
R134
C116
C115
R133
C117
R128
C112
R126
C111
R135
R129
C113
C109
IC102
R125
C114
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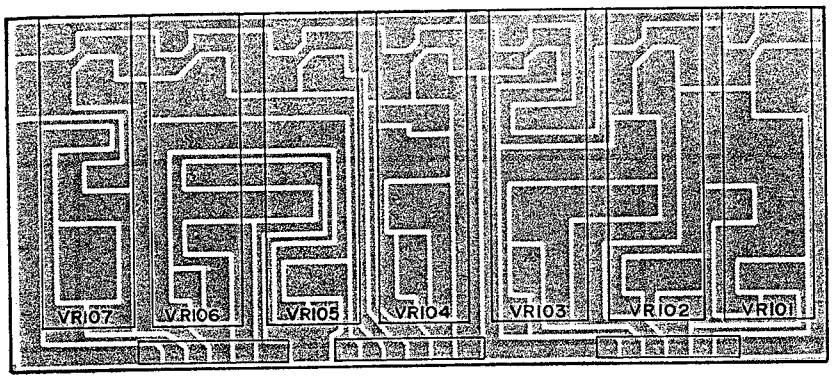
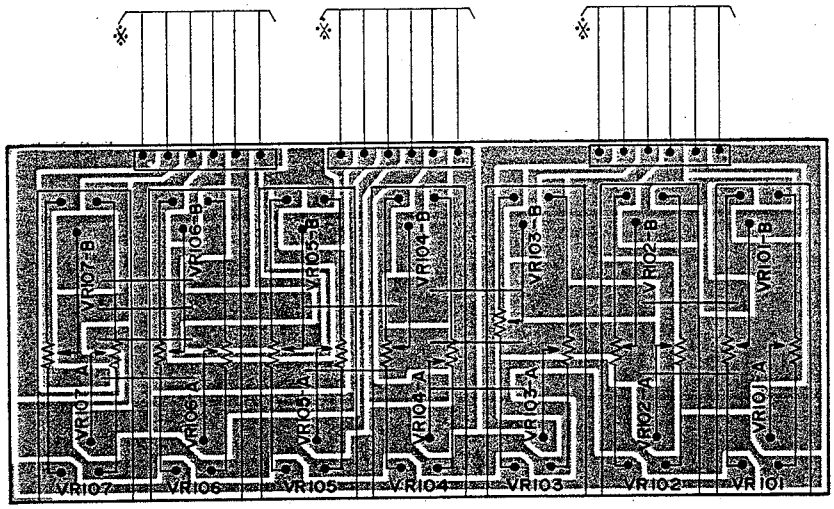
C107
R123
R122
R120
R119
R115
C110
C106
C104
C103
R117
C105
R118
R113
C101
R112
R114
R130
R110
R111
R109
R108
R106
R107
R105
R102
R101
R104
R103
C10
C13
C2
C216
BRN
ORG
BLU
BLU
RED
RED
ORG
VR201
VR201 A
VR201 B
GRY
WHT
C219
C220
L801
RL801

Bottom View

● Volume P.C. Board

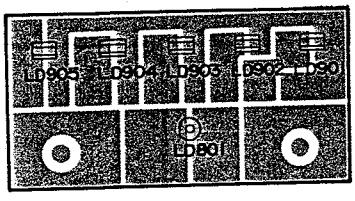


Top View

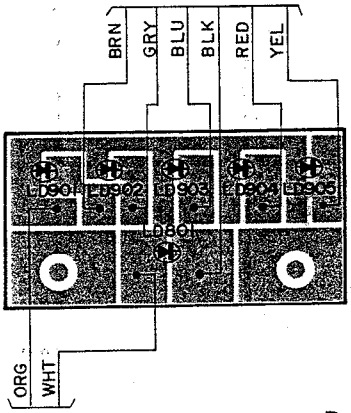


Bottom View

● LED P.C. Board



Top View



Bottom View

A B C D E F G H

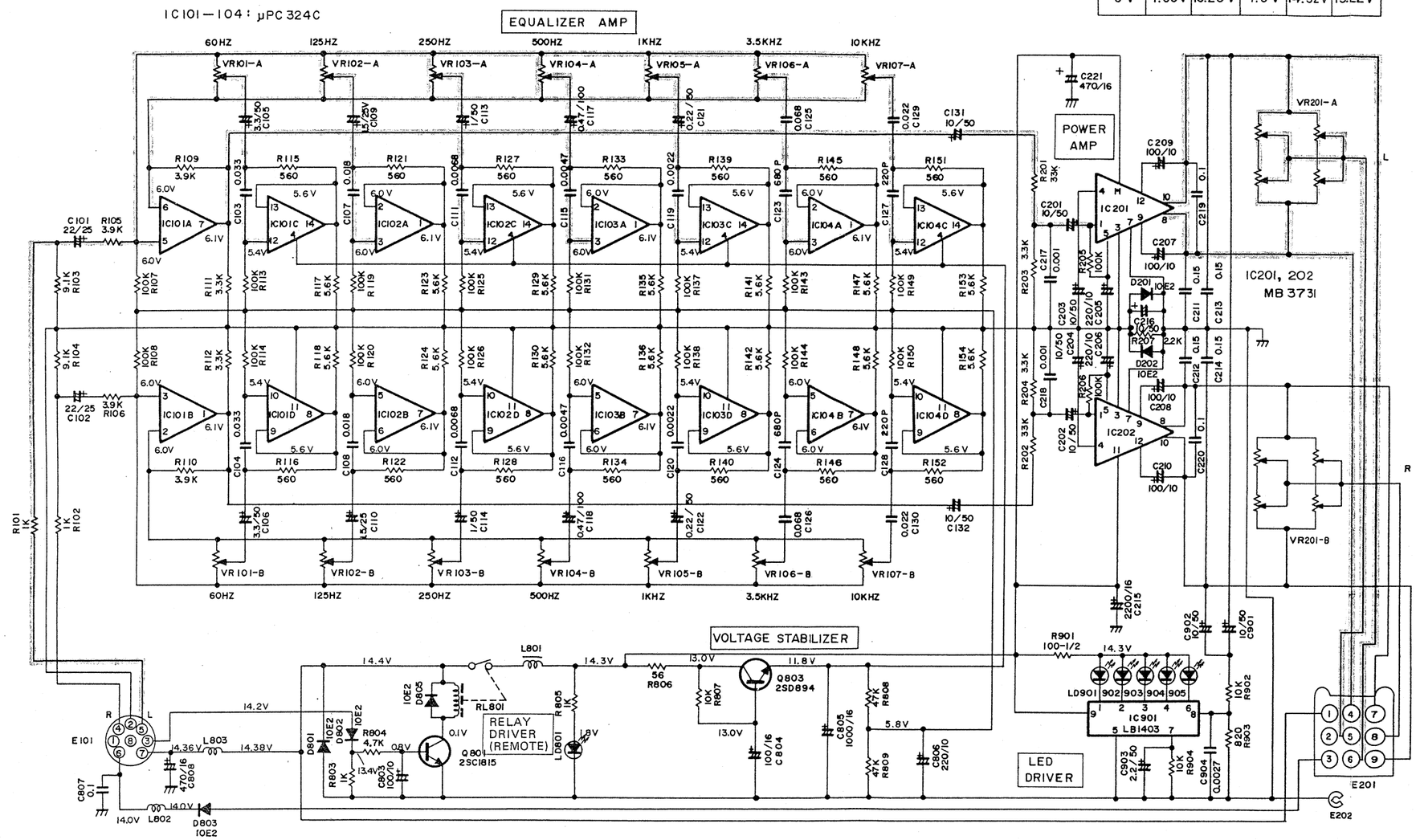
Schematic Diagram

IC101—104 : μPC324C

IC201 , IC202

1	2	3	4	5	6
4.15V	0 V	0.75 V	4.16 V	4.16V	3.80 V

7	8	9	10	11	12
0 V	7.60V	13.25 V	7.6 V	14.32V	13.22V



E201 Output Connector

1	ACC
2	—
3	+B Battery
4	Left Front ⊕
5	Left Front ⊖ Left Rear ⊕
6	Left Rear ⊖
7	Right Front ⊕
8	Right Front ⊖ Right Rear ⊕
9	Right Rear ⊖

E101 Input DIN Connector

1	———
2	Signal Ground
3	+B for Remote
4	Signal Right Input
5	Signal Left Input
6	+B Battery
7	+B ACC
8	Shield Ground

IC901

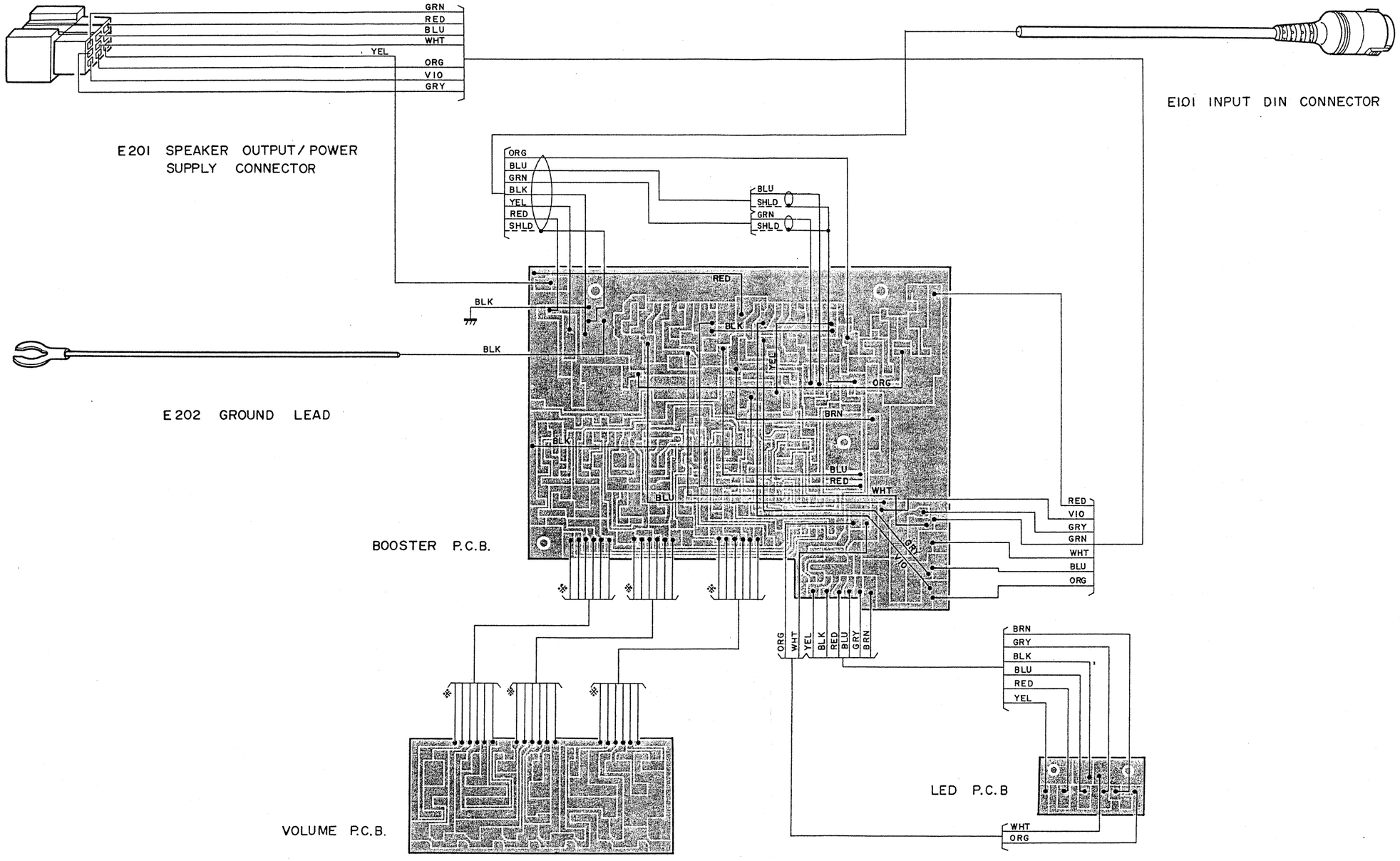
1~4 , 6	5	7	8	9
12.9V	0 V	0.28V	0.03V	14.32V

NOTE:

UNLESS OTHERWISE SPECIFIED,

1. ALL RESISTANCE VALUES ARE IN OHMS K=1,000 M=1,000,000
2. ALL RESISTORS ARE RATED AT ¼ WATT, 5%
3. ALL CAPACITANCE VALUES ARE IN MICRO-FARAD (μF) P=10 ^{6}μF
4. ALL CAPACITORS ARE RATED AT 500WV

Wiring Diagram



Electrical Parts List

Resistors: (All resistors are carbon film, ±5% unless otherwise noted.)
μF = microfarads, pF = picofarads.

Symbol No.	Part No.	Description
	Booster P.C. Board	
ICs		
IC101	51T44289U01	μPC324C
IC102	51T44289U01	μPC324C
IC103	51T44289U01	μPC324C
IC104	51T44289U01	μPC324C
IC201	51T53245F01	MB3731M
IC202	51T53245F01	MB3731M
IC901	51T61284F01	LB1403
Transistors		
Q801	48S43525F02	2SC1815-Y
Q803	48T47166F01	2SD894
Diodes		
D201	48C40235G02	10E2
D202	48C40235G02	10E2
D801	48C40235G02	10E2
D802	48C30235G02	10E2
D803	48C40235G02	10E2
D805	48C40235G02	10E2
LEDs		
LD801	48T50886F02	AA3432S (AMB) (Remote)
LD901	48T52238F01	BG5552K (GRN) (Level)
LD902	48T52238F01	BG5552K (GRN) (Level)
LD903	48T52238F04	AA5552K (ORG) (Level)
LD904	48T52238F04	AA5552K (ORG) (Level)
LD905	48T52238F02	PR5552K (RED) (Level)
Coils		
L801	25T40405F02	Choke Filter
L802	25C40894G11	Choke, Trans
L803	25C40894G11	Choke, Trans
Relay		
RL801	80T40631F01	Relay FBR-311

Symbol No.	Part No.	Description
Resistors		
VR101	18T40950T03	Vol., Slide 20k ohm (B)
VR102	18T40950T03	Vol., Slide 20k ohm (B)
VR103	18T40950T03	Vol., Slide 20k ohm (B)
VR104	18T40950T03	Vol., Slide 20k ohm (B)
VR105	18T40950T03	Vol., Slide 20k ohm (B)
VR106	18T40950T03	Vol., Slide 20k ohm (B)
VR107	18T40950T03	Vol., Slide 20k ohm (B)
VR201	18T51771F01	Fader, Control
R101	06S41801P32	1k ohm 1/4W
R102	06S41801P32	1k ohm 1/4W
R103	06S40105T88	9.1k ohm 1/4W
R104	06S40105T88	9.1k ohm 1/4W
R105	06S41801P39	3.9k ohm 1/4W
R106	06S41801P39	3.9k ohm 1/4W
R107	06S41801P56	100k ohm 1/4W
R108	06S41801P56	100k ohm 1/4W
R109	06S41801P39	3.9k ohm 1/4W
R110	06S41801P39	3.9k ohm 1/4W
R111	06S41801P38	3.3k ohm 1/4W
R112	06S41801P38	3.3k ohm 1/4W
R113	06S41801P56	100k ohm 1/4W
R114	06S41801P56	100k ohm 1/4W
R115	06S41801P29	560 ohm 1/4W
R116	06S41801P29	560 ohm 1/4W
R117	06S41801P41	5.6k ohm 1/4W
R118	06S41801P41	5.6k ohm 1/4W
R119	06S41801P56	100k ohm 1/4W
R120	06S41801P56	100k ohm 1/4W
R121	06S41801P29	560 ohm 1/4W
R122	06S41801P29	560 ohm 1/4W
R123	06S41801P41	5.6k ohm 1/4W
R124	06S41801P41	5.6k ohm 1/4W
R125	06S41801P56	100k ohm 1/4W
R126	06S41801P56	100k ohm 1/4W
R127	06S41801P29	560 ohm 1/4W
R128	06S41801P29	560 ohm 1/4W
R129	06S41801P41	5.6k ohm 1/4W
R130	06S41801P41	5.6k ohm 1/4W
R131	06S41801P56	100k ohm 1/4W
R132	06S41801P56	100k ohm 1/4W
R133	06S41801P29	560 ohm 1/4W
R134	06S41801P29	560 ohm 1/4W
R135	06S41801P41	5.6k ohm 1/4W

Symbol No.	Part No.	Description
R136	06S41801P41	5.6k ohm 1/4W
R137	06S41801P56	100k ohm 1/4W
R138	06S41801P56	100k ohm 1/4W
R139	06S41801P29	560 ohm 1/4W
R140	06S41801P29	560 ohm 1/4W
R141	06S41801P41	5.6k ohm 1/4W
R142	06S41801P41	5.6k ohm 1/4W
R143	06S41801P56	100k ohm 1/4W
R144	06S41801P56	100k ohm 1/4W
R145	06S41801P29	560 ohm 1/4W
R146	06S41801P29	560 ohm 1/4W
R147	06S41801P41	5.6k ohm 1/4W
R148	06S41801P41	5.6k ohm 1/4W
R149	06S41801P56	100k ohm 1/4W
R150	06S41801P56	100k ohm 1/4W
R151	06S41801P29	560 ohm 1/4W
R152	06S41801P29	560 ohm 1/4W
R153	06S41801P41	5.6k ohm 1/4W
R154	06S41801P41	5.6k ohm 1/4W
R201	06S41801P50	33k ohm 1/4W
R202	06S41801P50	33k ohm 1/4W
R203	06S41801P38	3.3k ohm 1/4W
R204	06S41801P38	3.3k ohm 1/4W
R205	06S40106T14	100k ohm 1/4W
R206	06S40106T14	100k ohm 1/4W
R207	06S41801P36	2.2k ohm 1/4W
R803	06S41801P32	1k ohm 1/4W
R804	06S41801P40	4.7k ohm 1/4W
R805	06S41801P32	1k ohm 1/4W
R806	06S41801P17	56 ohm 1/4W
R807	06S41801P44	10k ohm 1/4W
R808	06S41801P52	47k ohm 1/4W
R809	06S41801P52	47k ohm 1/4W
R901	06D44744G20	100 ohm 1/2W
R902	06S41801P44	10k ohm 1/4W
R903	06S41801P31	820 ohm 1/4W
R904	06S41801P44	10k ohm 1/4W
Capacitors		
C101	23S41198U15	Electrolytic 22μF 25V
C102	23S41198U15	Electrolytic 22μF 25V
C103	08C44833J19	Mylar 0.033μF
C104	08C44833J19	Mylar 0.033μF
C105	23S41198U07	Electrolytic 3.3μF 50V
C106	23S41198U07	Electrolytic 3.3μF 50V
C107	08C44833J16	Mylar 0.018μF
C108	08C44833J16	Mylar 0.018μF
C109	23S41059P09	Tantalum 1.5μF 25V
C110	23S41059P09	Tantalum 1.5μF 25V
C111	08C44833J11	Mylar 0.0068μF
C112	08C44833J11	Mylar 0.0068μF
C113	23S41198U03	Electrolytic 1μF 50V
C114	23S41198U03	Electrolytic 1μF 50V
C115	08C44833J09	Mylar 0.0047μF
C116	08C44833J09	Mylar 0.0047μF
C117	23S41198U02	Electrolytic 0.47μF 100V
C118	23S41198U02	Electrolytic 0.47μF 100V
C119	08C44833J05	Mylar 0.0022μF
C120	08C44833J05	Mylar 0.0022μF
C121	23C42909J01	Electrolytic 0.22μF 50V
C122	23C42909J01	Electrolytic 0.22μF 50V
C123	21C45322G39	Ceramic 680pF
C124	21C45322G39	Ceramic 680pF
C125	08C44833J23	Mylar 0.068μF
C126	08C44833J23	Mylar 0.068μF
C127	21C45322G25	Ceramic 220pF
C128	21C45322G25	Ceramic 220pF
C129	08C44833J17	Mylar 0.022μF
C130	08C44833J17	Mylar 0.022μF
C131	23S41198U12	Electrolytic 10μF 50V
C132	23S41198U12	Electrolytic 10μF 50V
C201	23S41198U12	Electrolytic 10μF 50V
C202	23S41198U12	Electrolytic 10μF 50V
C203	23S41198U12	Electrolytic 10μF 50V
C204	23S41198U12	Electrolytic 10μF 50V
C205	23S41198U40	Electrolytic 220μF 10V
C206	23S41198U40	Electrolytic 220μF 10V
C207	23S41198U33	Electrolytic 100μF 10V
C208	23S41198U33	Electrolytic 100μF 10V
C209	23S41198U33	Electrolytic 100μF 10V
C210	23S41198U33	Electrolytic 100μF 10V
C211	08C44833J27	Mylar 0.15μF
C212	08C44833J27	Mylar 0.15μF
C213	08C44833J27	Mylar 0.15μF
C214	08C44833J27	Mylar 0.15μF
C215	23S41198U71	Electrolytic 2200μF 16V
C216	23S41198U12	Electrolytic 10μF 50V
C217	08C44833J01	Mylar 0.001μF
C218	08C44833J01	Mylar 0.001μF
C219	08C44833J25	Mylar 0.1μF

Symbol No.	Part No.	Description
C220	08C44833J25	Mylar 0.1μF
C221	23C4217OG30	Electrolytic 470μF 16V
C803	23S41198U33	Electrolytic 100μF 10V
C804	23S41198U34	Electrolytic 100μF 16V
C805	23T51232F02	Electrolytic 1000μF 16V
C806	23S41198U40	Electrolytic 220μF 10V
C807	08T44979P14	Ceramic 0.1μF
C808	23S41198U56	Electrolytic 470μF 16V
C901	23S41198U12	Electrolytic 10μF 50V
C902	23S41198U12	Electrolytic 10μF 50V
C903	23S41198U05	Electrolytic 2.2μF 50V
C904	08C44833J06	Mylar 0.0027μF
Miscellaneous Parts		
E101	01T57590F02	Input DIN Connector
E201	01D45255F15	Speaker Output/Power Supply Connector
E202	30T40438U08	Ground Lead

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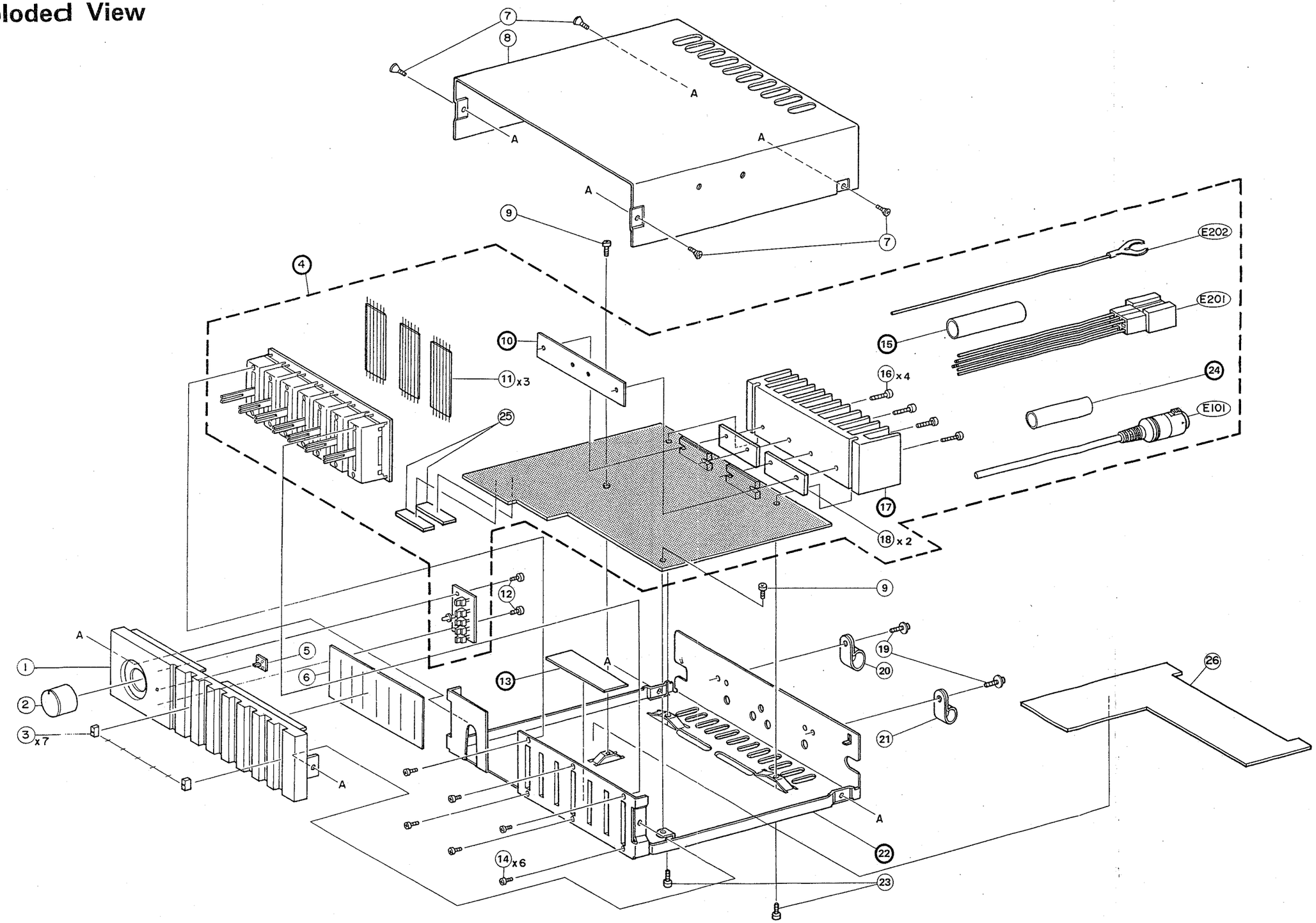
Mechanical Parts List

The alpha-numeric codes suffixed to the numeric symbol numbers in the parts list identify the location codes of the respective components in the exploded views.

Symbol No.	Part No.	Description
	General Assembly Parts	
1 5A	13C58112F01	Nosepiece
2 5A	36B58114F01	Knob, Rotary
3 5A	36B58116F02	Knob, Slide
4 2B	*	Assy., Booster P.C.B.
5 5B	61A58120F01	Lens, Crystal
6 5B	14A58459F01	Insulator, Dust
7	03S44205G50	Screw, Countersink (M3x6)
8 1D	15C58119F02	Cover, Top
9	03S44205G01	Screw, Pan (M3x6)
10 3D	*	Bracket, IC
11 3D	30T58162F01	Cable, Flat
12 4D	03S40012G22	Screw, Tapping (M2.6x6)
13 5D	*	Insulator, Fiber
14 6D	03S40011G33	Screw, Pan (M2x4)
15 3F	*	Tube, UL CSA Vinyl (70 mm)
16 3F	03S40011G22	Screw, Pan (M3x12)
17 4F	*	Heat Sink
18 4F	*	Insulator, Transistor
19 5F	03S40018G02	Screw, Tapping (M3x8)
20 5F	42B41424G05	Clamp, Cord
21 5F	42B41424G03	Clamp, Cord
22 6F	*	Chassis, Base
23 6F	03S44205G03	Screw, Pan (M3x8)
24 3H	*	Tube, UL CSA Vinyl (50 mm)
25 3D	43A52836F15	Bushing, Panel
26 5H	14A60894F01	Insulator, Fiber

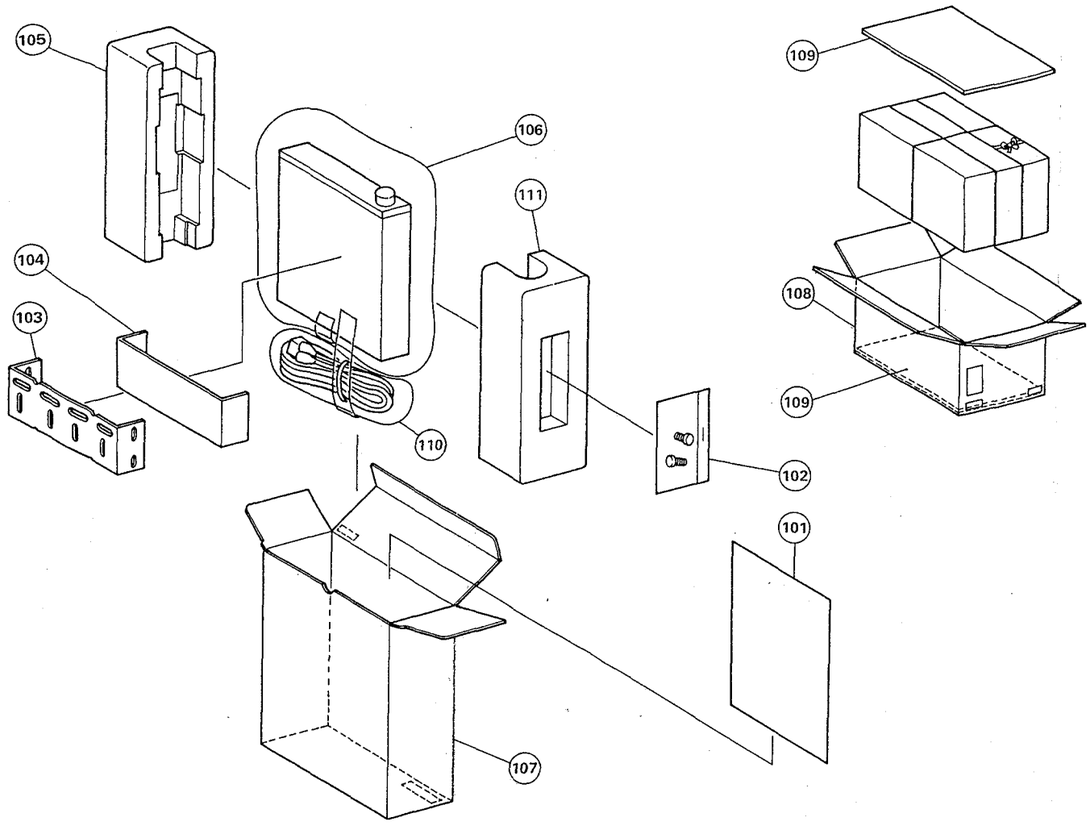
* not supplied

Exploded View



A B C D E F G H

Packing Method View



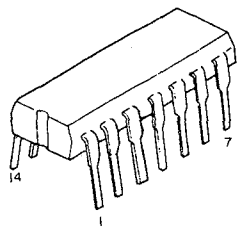
Packing Parts List

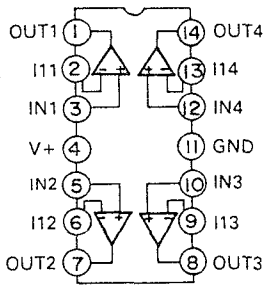
Symbol No.	Part No.	Description
	Assembly Packing Parts	
▲ 101	68P55888F68	Manual, Owners
■ 101	01V59200F67	Assy., Pamphlet
■ 101-1	*	Owner's Manual
■ 101-2	*	Service Facilities
■ 101-3	*	Business Reply Card
■ 101-4	*	Sack, Polyethylene
■ 101-5	*	Limited Warranty
102	01V53500F20	Assy., Kit Installation
102-1	*	Screw, Tapping (M5x20)
102-2	*	Bolt, Hex. w/Washer (M4x8)
102-3	*	Sack, Polyethylene
103	07B51862F01	Bracket, "U" Mounting
104	56A51863F01	Pad, Sheet
105	56C60877F02	Tray, Packing
106	56B40990T21	Sack, Polyethylene
▲ 107	56B47663F32	Carton, Packing (Ind.)
■ 107	56C40409F30	Carton, Packing (Ind.)
108	*	Carton, Packing (Master)
109	*	Pad, Packing
110	01D45256F14	Assy., Kit, Wire
111	56C60877F01	Tray, Packing
Labels		
	54B42124G01	Serial No. (Individual Carton)
▲	54A60370F01	Composite (Bottom Chassis)
▲	54A61193F01	Korea (Ind. Carton)
■	54A61193F01	Korea (Rear Cover)
■	54A58169F01	Composite (Bottom Chassis)

* not supplied
▲ for general foreign version only.
■ for north american version only.

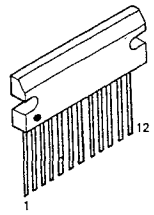
Semiconductors Lead Identifications

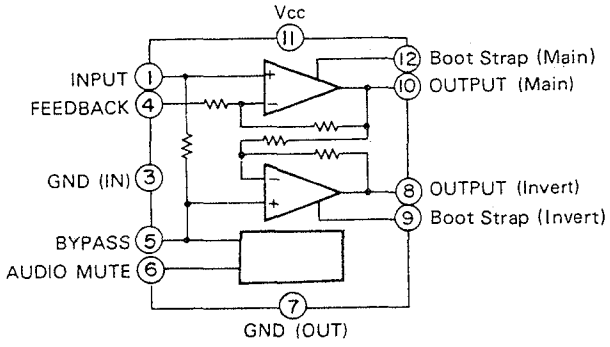
(μPC324C) IC101, IC102, IC103, IC104



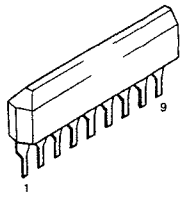


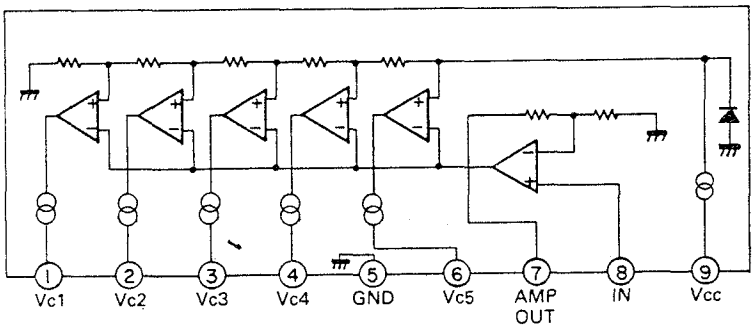
(MB3731) IC201, IC202



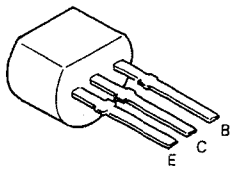


(LB1403) IC901





(2SC1815Y) Q801



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